

SUBCHAPTER D : PATHOGEN AND VECTOR ATTRACTION REDUCTION

§312.81. Scope.

(a) This subchapter contains the requirements that must be met for a sewage sludge to be classified either Class A or Class B with respect to pathogen reduction.

(b) This subchapter contains the site restrictions for the land on which a sewage sludge that is Class B with respect to pathogens is either land applied for beneficial use or placed on an active sludge unit.

(c) This subchapter contains the pathogen reduction requirements for domestic septage applied to agricultural land, forest, or a reclamation site for beneficial use and the pathogen reduction requirements for domestic septage placed on an active sludge unit.

(d) This subchapter contains the site restrictions for the land on which domestic septage is applied for beneficial use or placed on an active sludge unit.

(e) This subchapter contains the vector attraction reduction requirements for sewage sludge and domestic septage land applied for beneficial use or placed on an active sludge unit.

Adopted September 26, 1995

Effective October 13, 1995

§312.82. Pathogen Reduction.

(a) Sewage sludge - Class A.

(1) Compliance requirements - Class A.

(A) For a sewage sludge to be classified as Class A with respect to pathogens, the requirements in subparagraphs (B) and (C) of this paragraph and the requirements of one of the alternatives listed in paragraph (2) of this subsection shall be met.

(B) The requirements of the chosen alternative for pathogen reduction from paragraph (2) of this subsection shall be met prior to or at the same time as the vector attraction reduction requirements, except the requirements in paragraphs §312.83(b)(6)-(8) of this title (relating to Vector Attraction Reduction).

(C) Either the density of fecal coliform in the sewage sludge shall be less than 1,000 Most Probable Number per gram of total solids (dry weight basis) or the density of *Salmonella* sp. bacteria in the sewage sludge shall be less than three Most Probable Number per four grams of total solids (dry weight basis) at the time the sewage sludge is used or disposed of, at the time the sewage sludge is prepared for sale or give away in a bag or other container for application to the land, or at the

time the sewage sludge or material derived from sewage sludge is prepared to meet the requirements in §312.41(b), (c), (e) or (f) of this title (relating to Applicability).

(2) Compliance alternatives - Class A.

(A) Alternative 1. The temperature of the sewage sludge that is used or disposed of shall be maintained at a specified value for a period of time.

(i) When the percent solids of the sewage sludge is 7.0% or higher, the temperature of the sewage sludge shall be 50 degrees Celsius or higher; the time period shall be 20 minutes or longer; and the temperature and time period shall be determined using equation (2), except when small particles of sewage sludge are heated by either warmed gases or an immiscible liquid. (See Figure 13: §312.82(A)(2)(i)).

Figure 13: 30 TAC §312.82 (a)(2)(A)(i)

$$D > \frac{131,700,000}{10^{0.1400t}} \quad (2)$$

D = time in days.

t = temperature in degrees Celsius.

(ii) When the percent solids of the sewage sludge is 7.0% or higher and small particles of sewage sludge are heated by either warmed gases or an immiscible liquid, the temperature of the sewage sludge shall be 50 degrees Celsius or higher, the time period shall be 15 seconds or longer, and the temperature and time period shall be determined using equation (2) as found in clause (i) of this subparagraph.

(iii) When the percent solids of the sewage sludge is less than 7.0% and the time period is at least 15 seconds, but less than 30 minutes, the temperature and time period shall be determined using equation (2) as found in clause (i) of this subparagraph.

(iv) When the percent solids of the sewage sludge is less than 7.0%; the temperature of the sewage sludge is 50 degrees Celsius or higher; and the time period is 30 minutes or longer, the temperature and time period shall be determined using equation (3). (See Figure 14: §312.82(A)(2)(iv)).

Figure 14: 30 TAC §312.82 (a)(2)(A)(iv)

$$D > \frac{50,070,000}{10^{0.1400t}} \quad (3)$$

$$10^{0.1400t}$$

D = time in days.

t = temperature in degrees Celsius.

(B) Alternative 2. The temperature and pH of the sewage sludge that is used or disposed of shall be maintained at specific values for periods of time.

(i) The pH of the sewage sludge shall be raised to above 12 and shall remain above 12 for 72 hours.

(ii) The temperature of the sewage sludge shall be above 52 degrees Celsius for 12 hours or longer during the period that the pH of the sewage sludge is above 12.

(iii) At the end of the 72 hour period during which the pH of the sewage sludge is above 12, the sewage sludge shall be air dried to achieve a percent solids in the sewage sludge greater than 50%.

(C) Alternative 3. The sewage sludge that is used or disposed of shall be analyzed prior to pathogen treatment determine whether the sewage sludge contains enteric viruses and viable helminth ova.

(i) When the density of enteric viruses in the sewage sludge prior to pathogen treatment is less than one Plaque-forming Unit per four grams of total solids (dry weight basis), the sewage sludge is Class A with respect to enteric viruses until the next monitoring episode for the sewage sludge.

(ii) When the density of enteric viruses in the sewage sludge prior to pathogen treatment is equal to or greater than one Plaque-forming Unit per four grams of total solids (dry weight basis), the sewage sludge is Class A with respect to enteric viruses when the density of enteric viruses in the sewage sludge after pathogen treatment is less than one Plaque-forming Unit per four grams of total solids (dry weight basis) and when the values or ranges of values for the operating parameters for the pathogen treatment process that produces the sewage sludge that meets the enteric virus density requirement are documented.

(iii) After the enteric virus reduction in clause (ii) of this subparagraph is demonstrated for the pathogen treatment process, the sewage sludge continues to be Class A with respect to enteric viruses when the values for the pathogen treatment process operating parameters are consistent with the values or ranges of values documented in clause (ii) of this subparagraph.

(iv) When the density of viable helminth ova in the sewage sludge prior to pathogen treatment is less than one per four grams of total solids (dry weight basis), the sewage sludge is Class A with respect to viable helminth ova until the next monitoring episode for the sewage sludge.

(v) When the density of viable helminth ova in the sewage sludge prior to pathogen treatment is equal to or greater than one per four grams of total solids (dry weight basis), the sewage sludge is Class A with respect to viable helminth ova when the density of viable helminth ova in the sewage sludge after pathogen treatment is less than one per four grams of total solids (dry weight basis) and when the values or ranges of values for the operating parameters for the pathogen treatment process that produces the sewage sludge that meets the viable helminth ova density requirement are documented.

(vi) After the viable helminth ova reduction in clause (v) of this subparagraph is demonstrated for the pathogen treatment process, the sewage sludge continues to be Class A with respect to viable helminth ova when the values for the pathogen treatment process operating parameters are consistent with the values or ranges of values documented in clause (v) of this subparagraph.

(D) Alternative 4. The sewage sludge that is used or disposed of shall be analyzed prior to pathogen treatment to determine whether the sewage sludge contains enteric viruses and viable helminth ova.

(i) The density of enteric viruses in the sewage sludge shall be less than one Plaque-forming Unit per four grams of total solids (dry weight basis) at the time the sewage sludge is used or disposed of, at the time the sewage sludge is prepared for sale or give away in a bag or other container for application to the land, or at the time the sewage sludge or material derived from sewage sludge is prepared to meet the requirements in §312.41(b), (c), (e), or (f) of this title (relating to Applicability).

(ii) The density of viable helminth ova in the sewage sludge shall be less than one per four grams of total solids (dry weight basis) at the time the sewage sludge is used or disposed of, at the time the sewage sludge is prepared for sale or given away in a bag or other container for application to the land, or at the time the sewage sludge or material derived from sewage sludge is prepared to meet the requirements in §312.41(b), (c), (e), or (f) of this title.

(E) Alternative 5 (PFRP). Sewage sludge that is used or disposed of shall be treated in one of the Processes to Further Reduce Pathogens (PFRP) described in 40 Code of Federal Regulations, Part 503, Appendix B.

(F) Alternative 6 (PFRP Equivalent). Sewage sludge that is used or disposed of shall be treated in a process that has been approved by the U.S. Environmental Protection Agency as being equivalent to those in subparagraph (E) of this paragraph.

(b) Sewage sludge - Class B.

(1) Compliance requirements - Class B.

(A) For a sewage sludge to be classified as Class B with respect to pathogens, the requirements in subparagraphs (B) and (C) of this paragraph shall be met. As an alternative for a sewage sludge to be classified as Class B, the requirements of subparagraph (B) of this paragraph and paragraph (2) of this subsection shall be met.

(B) The site restrictions in paragraph (3) of this subsection shall be met when sewage sludge that is classified as Class B with respect to pathogens is applied to the land for beneficial use.

(C) A minimum of seven samples of the sewage sludge shall be collected within 48 hours of the time the sewage sludge is used or disposed of during each monitoring episode for the sewage sludge. The geometric mean of the density of fecal coliform for the samples collected shall be less than either 2,000,000 Most Probable Number per gram of total solids (dry weight basis) or 2,000,000 Colony forming Units per gram of total solids (dry weight basis).

(2) PSRP compliance alternatives - Class B. Sewage sludge that is used or disposed of shall be treated in one of the Processes to Significantly Reduce Pathogens described in 40 CFR Part 503, Appendix B or shall be treated by an equivalent process approved by the U.S. Environmental Protection Agency, so long as all of the following requirements are met by the generator of the sewage sludge:

(A) Prior to use or disposal, all the sewage sludge must have been generated from a single location, except as provided in subparagraph (F) of this paragraph;

(B) An independent Texas registered professional engineer must make a certification to the generator of a sewage sludge that the wastewater treatment facility generating the sewage sludge is designed to achieve one of the Processes to Significantly Reduce Pathogens at the permitted design loading of the facility. The certification need only be repeated if the design loading of the facility is increased. The certification shall include a statement indicating the design meets all the applicable standards specified in Appendix B of 40 CFR Part 503;

(C) Prior to any off-site transportation or on-site use or disposal of any sewage sludge generated at a wastewater treatment facility, the chief certified operator of the wastewater treatment facility or other responsible official who manages the processes to significantly reduce pathogens at the wastewater treatment facility for the permittee, shall certify that the sewage sludge underwent at least the minimum operational requirements necessary in order to meet one of the Processes to Significantly Reduce

Pathogens. The acceptable processes and the minimum operational and recordkeeping requirements shall be in accordance with established U.S. Environmental Protection Agency final guidance;

(D) All certification records and operational records describing how the requirements of this paragraph were met shall be kept by the generator for a minimum of three years and be available for inspection by commission staff for review;

(E) In lieu of a generator obtaining a certification as specified in subparagraph (B) of this paragraph, the executive director will accept from the U.S. Environmental Protection Agency a finding of equivalency to the defined Processes to Significantly Reduce Pathogens; and

(F) If the sewage sludge is generated from a mixture of sources, resulting from a person who prepares sewage sludge from more than one wastewater treatment facility, the resulting derived product shall meet one of the Processes to Significantly Reduce Pathogens, and shall meet the certification, operation, and record keeping requirements of this paragraph.

(3) Site restrictions.

(A) Food crops with harvested parts totally above the land surface that touch the sewage sludge/soil mixture shall not be harvested from the land for at least 14 months after the application of sewage sludge.

(B) Food crops with harvested parts below the surface of the land shall not be harvested for at least 20 months after application of sewage sludge when the sewage sludge remains on the land surface for four months or longer prior to incorporation into the soil.

(C) Food crops with harvested parts below the surface of the land shall not be harvested for at least 38 months after application of sewage sludge when the sewage sludge remains on the land surface for less than four months prior to the incorporation into the soil.

(D) Food crops, feed crops and fiber crops shall not be harvested for at least 30 days after application of sewage sludge.

(E) Animals shall not be allowed to graze on the land for at least 30 days after application of sewage sludge.

(F) Turf grown on land where sewage sludge is applied shall not be harvested for at least one year after application of sewage sludge when the harvested turf is placed on either land with a high potential for public exposure or a lawn.

(G) Public access to land with a high potential for public exposure shall be restricted for at least one year after application of sewage sludge.

(H) Public access to land with a low potential for public exposure shall be restricted for at least 30 days after application of the sewage sludge.

(c) Domestic septage.

(1) The site restrictions in subsection (b) paragraph (3) of this section shall be met if domestic septage is applied to agricultural land, forest, or a reclamation site.

(2) The pH of domestic septage applied to agricultural land, forest, or a reclamation site shall be raised to 12 or higher by alkali addition and, without the addition of more alkali, shall remain at 12 or higher for a period of 30 minutes.

Adopted September 26, 1995

Effective October 13, 1995

§312.83. Vector Attraction Reduction.

(a) Compliance requirements.

(1) One of the vector attraction reduction requirements in subsection (b)(1)-(10) of this section shall be met when bulk sewage sludge is applied to agricultural land, forest, a public contact site, or a reclamation site.

(2) One of the vector attraction reduction requirements in subsection (b)(1)-(8) of this section shall be met when bulk sewage sludge is applied to a lawn, home garden, or is sold or given away in a bag or other container.

(3) One of the vector attraction reduction requirements in subsection (b)(1)-(11) of this section shall be met when sewage sludge (other than domestic septage) is placed on an active sewage sludge unit.

(4) One of the vector attraction reduction requirements in subsection (b)(9), (10), or (12) of this section shall be met when domestic septage is applied to agricultural land, forest, or a reclamation site.

(5) One of the vector attraction reduction requirements in subsection (b)(9)-(12) of this section shall be met when domestic septage is placed on an active sewage sludge unit.

(b) Compliance alternatives.

(1) The mass of volatile solids in the sewage sludge shall be reduced by a minimum of 38%.

(2) If an anaerobically digested sewage sludge can not meet the 38% volatile solids reduction requirement in paragraph (1) of this subsection, vector attraction reduction can be demonstrated by digesting a portion of the previously digested sewage sludge anaerobically in a laboratory in a bench-scale unit for 40 additional days at a temperature between 30 and 37 degrees Celsius. If at the end of the 40 days, the volatile solids in the sewage sludge at the beginning of that period is reduced by less than 17%, vector attraction reduction is achieved.

(3) If an aerobically digested sewage sludge can not meet the 38% volatile solids reduction requirement in paragraph (1) of this subsection, vector attraction reduction can be demonstrated by digesting a portion of the previously digested sewage sludge that has a percent solids of 2.0% or less aerobically in a laboratory in a bench-scale unit for 30 additional days at 20 degrees Celsius. If at the end of the 30 days, the volatile solids in the sewage sludge at the beginning of that period is reduced by less than 15%, vector attraction reduction is achieved.

(4) The specific oxygen uptake rate (SOUR) for sewage sludge treated in an aerobic process shall be equal to or less than 1.5 milligrams of oxygen per hour per gram of total solids (dry weight basis) at a temperature of 20 degrees Celsius.

(5) Sewage sludge shall be treated in an aerobic process for 14 days or longer. During that time, the temperature of the sewage sludge shall be higher than 40 degrees Celsius and the average temperature of sewage sludge shall be higher than 45 degrees Celsius.

(6) The pH of sewage sludge shall be raised to 12 or higher by alkali addition and, without the addition of more alkali, shall remain at 12 or higher for two hours and then remain at a pH of 11.5 or higher for an additional 22 hours.

(7) The percent solids of sewage sludge that does not contain unstabilized solids generated in a primary wastewater treatment process shall be equal to or greater than 75% based on the moisture content and total solids prior to mixing with other materials.

(8) The percent solids of sewage sludge that contains unstabilized solids generated in a primary wastewater treatment process shall be equal to or greater than 90% based on the moisture content and total solids prior to mixing with other materials.

(9) Sewage sludge shall be injected below the surface of the land. No significant amount of the sewage sludge shall be present on the land surface within one hour after the sewage sludge is injected. If the sewage sludge that is injected below the surface of the land is Class A with respect to pathogens, as described in §312.82 (relating to Pathogen Reduction), the sewage sludge shall be injected below the land surface within eight hours after the sewage sludge is discharged from the pathogen treatment process.

(10) Sewage sludge applied to the land surface or placed on a surface disposal site shall be incorporated into the soil within six hours after application or placement on the land. If the sewage sludge that is incorporated into the soil is Class A with respect to pathogens, as described in §312.82 of this

title (relating to Pathogen Reduction), the sewage sludge shall be applied to or placed on the land within eight hours after the sewage sludge is discharged from the pathogen treatment process.

(11) Sewage sludge placed on an active sewage sludge unit shall be covered with soil or other material at the end of each operating day.

(12) The pH of domestic septage shall be raised to 12 or higher by alkali addition and, without the addition of more alkali, shall remain at 12 or higher for 30 minutes.

Adopted September 26, 1995

Effective October 13, 1995

Repeal of: §312.81-312.83

Addition of (New): §312.81-312.83

Adopted date: September 26, 1995

Filed with the Secretary of State: September 18, 1995

Effective date: October 13, 1995